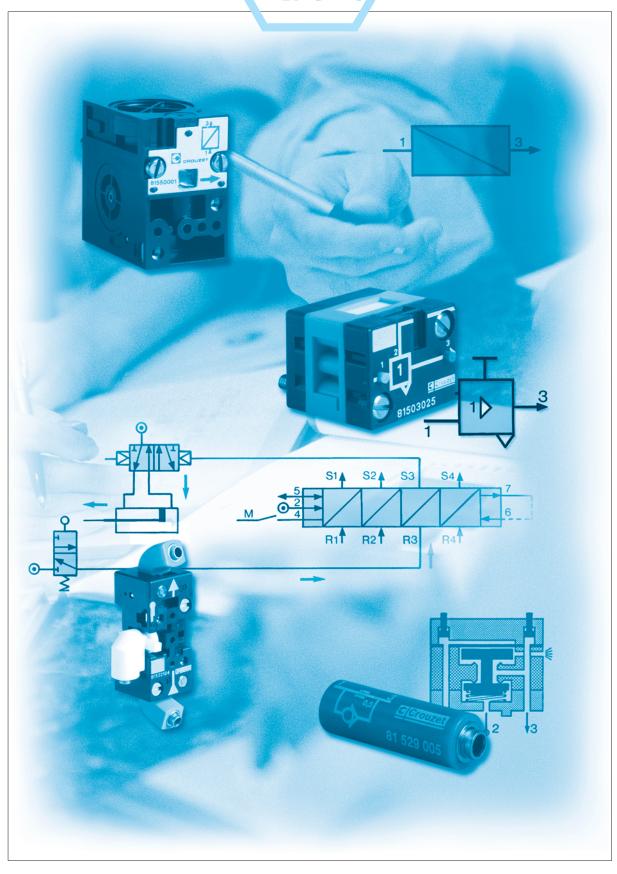
Pneumatic logic components



Visit our website for further information @ www.crouzet.com

General characteristics

Operating fluid

- Compressed air or inert gas.

Conditions of use

- Operating pressure 2 at 8 bars (except for special conditions).
- Fluid: Filtered air to 50 microns non lubricated.
- Operating temperature from 5° C to + 50° C (under + 5° C the dew point must be below 10° C for the application).
- For optimum performance, the elements should be inter-connected by air supply tubing with an internal diameter ≥ at 2.5 mm.

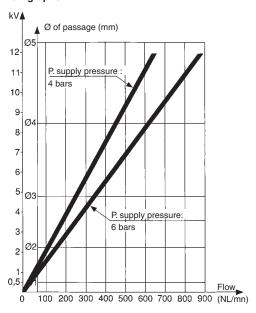
Mounting recommendations

- The elements should be mounted and piped in a clean atmosphere in order to prevent any form of pollution entering the system.
- Minimum torque for element fixing screws:
 5 cm/kg
- maximum torque for element fixing screws: 10 cm/kg.

Characteristics common to all elements in the modular system

- The characteristics have been obtained with a supply pressure at 6 hars
- The flow in NI/min is the number of litres of air at normal atmospheric pressure obtained with the output open to atmophere and the supply pressure at 4 bars
- The consumption in NI/min is the number of litres of free air necessary for the unit to function.
- kV = the flow coefficient of the equipment.
- Mechanical life > 10⁷ operations.

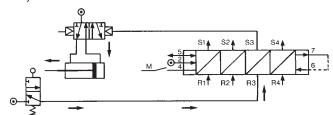
flow graphs



Sequencer modules

Operation results from the combination of a sequential cycle. A system comprises individual modules which are joined together by means of a sub-base. Each module has a memory which delivers an output signal and receives an input signal.

An indicator on each module allows the operator to monitor the progress of the cycle and identity quickly and easily any fault which may occur.



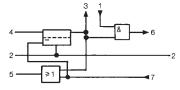
Operation results from the combination of three functions (memory, AND and OR) which constitute each module.

The memory activates the output and gives priority to the reset signal. The AND element ensures the transition to the next module but only if an input signal is present.

The OR element ensures the resetting of all previously operated

The OR element ensures the resetting of all previously operated modules

Function diagram



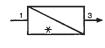
sequencer module with maintained reset

Brake

This maintains the memory spool in position only when the supply is lost.

Module with auto reset





Brake

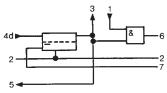
This returns the memory spool to the reset condition only when the supply is lost $% \left\{ 1,2,\ldots,n\right\}$

Shift register

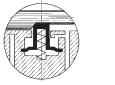
The general principle is to advance the sequencer step by command impulses to the inputs of the even steps, alternating with the command impulses to the inputs of the odd steps.

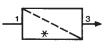
Used for example on a transfer machine to shift the information "bad component" collected at a test-test "n" steps further along the machine to a reject station.

Function diagram



Auto reset sequencer module





$\langle {\it E}_{\sf X} angle$ Sequencer modules

FILE No. C.PN.HOM.00009.FR INERIS No. 18409/05

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC





81 550 013	
61 330 013	ı
with 'maintain'	
with maintain	

81 550 213 Reset to zero

81 550 403 with 'maintain'

81 550 603

shift register Classification

sequencer

(€ II 2 GD c IIB 65°C(T6) X

Reset to zero

Symbol

Versions









Characteristics

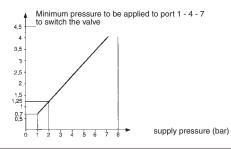
Characteristics	
Operating pressure	bar
Orifice diameter	mm
Flow at 6 bars	NI/min
Operating temperature	°C
Mechanical life 5 x 10 ⁶ at 6 bars	
Connection - Sub-base page 26	
Weight	g

2 • 8		
2.7		
150		
-5 +50		
	•	
	•	
70		

2 • 8	
2.7	
150	
-5 +50	
	•
	•
70	

2 • 8	
2.7	
150	
-5 +50	
	•
	•
70	

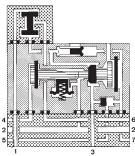




Principle of operation

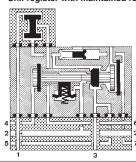
(supplied without logic element. For choice of units see page 28-29)

Sequencer module with maintained reset



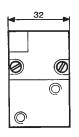
- 1 Input signal
- 2 Supply 3 Output signal
- 4 Start signal
- 5 In cycle signal
- 6 End of cycle signal
- 7 Reset to zero signal

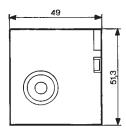
Shif register with maintained reset



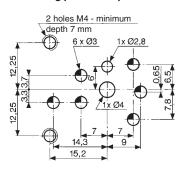
- 1 Input signal
- 2 Supply 3 Output signal
- 4 Start signal
- 5 In cycle signal
- 6 End of cycle signal
- 7 Reset to zero signal

Dimensions





Mounting plan for sequencer



$\langle \epsilon_{\mathsf{X}} \rangle$ Sequencer sub-bases

FILE No. C.PN.HOM.00009.FR INERIS No. 18409/05

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC



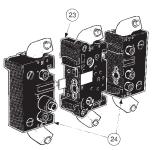




			01331104	61 332 103	61 332 003
Versions	Front connecting (DIN-omega)		Sub-base (DIN oméga)	End bases - one pair	Diversion base
versions	Rear connecting (with clips)		<u> </u>	_	-
Classificat	tion		C€ II 2 GD c IIB T6 X		
Charact	eristics				
Sub-bases	s Rotatable connectors		•	•	•
(fitted)	Pressure indicators		•	•	•
Operating	temperature	°C	-5 +50	-5 +50	-5 +50
Weight		g	55	135	60

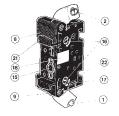
Sequencer connections





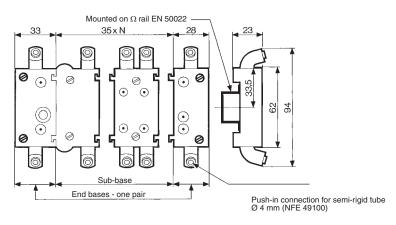
- 1 Input port (green port 1) Ø 4
- 2 Output port (red port 1) Ø 4
- 3 Input port, cycle start (green port 1) Ø 4
- 4 Output port, in-cycle signal (red port 1) Ø 4
- 5 Output port, cycle end (red port 6) Ø 4
- 6 Output port, cycle end (red port 6) Ø 4
- 7 Input port, reset to zero (green port 7) Ø 4
- 8 Output indicator (red)
- 9 Input indicator (green)
- 10 Cycle start indicator at port 4 (green)
- 11 In-cycle indicator at port 5 (red)
- 12 Input indicator at port 7 (green)
- 13 End of cycle indicator at port 6 (red)
- 14 Supply indicator at port 2 (yellow)
- 15 Interconnecting ports
- 16 Fixing screws
- 17 Engraved arrow to indicate direction of sequence
- 18 Marking tag
- 19 Marking tag position
- 20 Marking tag position
- 21 Mounting tongue
- 22 Mounting groove
- 23 Sub-base
- 24 End bases







Dimensions Front connecting



To order an $\langle Ex \rangle$ product, you must complete the form on page 53.







81 551 004

81 552 005

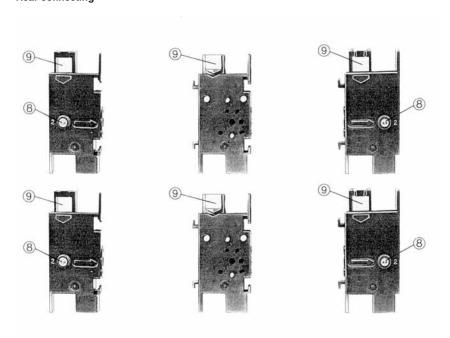
Sub-base (with clips)

End bases - one pair

(€ II 2 GD c IIB T6 X

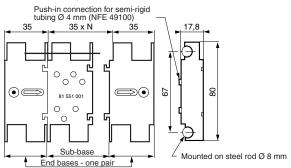
_	_
	•
-5 +50	-5 +50
40	120

Rear connecting



- 1 Input port (marked port 1)
- 2 Supply port (Port 2)
- 3 Output port (Port 3)
- 4 Cycle start signal port (Port 4)
- 5 In-cycle signal port (Port 5)
- 6 End of cycle signal port (Port 6)
- 7 Reset to zero signal port (Port 7)
- 8 Indicator at supply port
- 9 Marking area

Rear connecting



$\langle \xi_{\rm X} \rangle$ Logic elements

FILE No. C.PN.HOM.00007.FR INERIS No. 18408/05

Version

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC











81 521 508	81 540 015	81 540 017	81 522 505
—	—	—	
On Sub-base page 36-37	Plug-in	Plug-in	On Sub-ba
	Ø 4	Ø 6	36-37

	81 522 505
-	On Sub-base page

Classification	(€ © 2 G D c B 65°C(T6) X				
Symbol			1 >1 3		1 & 3 2 &
Characteristics					
Push-in connection for semi-rigid	Male/Female/Female	_	Ø 4 mm	_	_
tubing (NFE 49100)	Female/Female/Female	_	_	Ø 6 mm	_

Citatacleristics					
Push-in connection for semi-rigid	Male/Female/Female	_	Ø 4 mm	_	_
tubing (NFE 49100)	Female/Female/Female	_	_	Ø 6 mm	
Colour		Blue	Blue	Blue	Green
Operating pressure	bar	2 • 8	2 • 8	2 • 8	2 • 8
Orifice diameter	mm	2.7	2.7	4	2.7
Flow at 6 bars	NI/min	170	170	200	170
Pressure indicator		•	<u> </u>	_	•
Switching time	ms	_	_	_	<u> </u>
Operating temperature	°C	-5 +50	-5 +50	-5 +50	-5 +50
Mechanical life	operations	>10 ⁷	>10 ⁷	>10 ⁷	>10 ⁷
Weight	g	25	12	25	25

Pilot/pressure curves

P.p : Pilot pressure P.a : Supply pressure

Principle of operation



Cellule OR

The output signal "S" is present when a signal at "a" OR "b" is present:

S = a OR b

S = a + b



Cellule AND

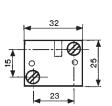
The output signal "S" is present only when signals "a" AND "b" are present simultaneously:

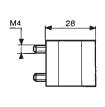
S = a AND b

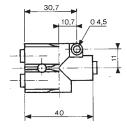
S = a.b

Dimensions

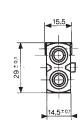
81 521 508 - 81 522 505

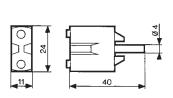






81 540 017 - 81 541 017





81 540 015 - 81 541 015

Other information

See page 36-37 for mounting plan for logic elements.







81 541 017









04	F 4 4	0015	
81	541	0015	
		_	

81 501 031

On sub-base page 36-37

81 503 028

Threshold On sub-base page 36-37

81 504 035

Threshold On sub-base page 36-37

81 506 027

Threshold On sub-base page 36-37

(€ II 2 G D c IIB 65°C(T6) X



25



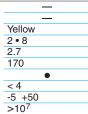






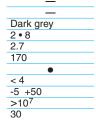
Ø 4 mm
_
Green
2 • 8
2.7
150
_
_
-5 +50
>10 ⁷
13

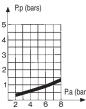
Ø 6 mm
Green
2 • 8
4
200
•
_
-5 +50
>10 ⁷

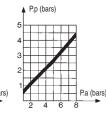


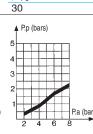
Orange
2 • 8
2.7
170
•
< 4
-5 +50

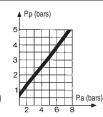
_	
Light grey	Da
2 • 8	2
2.7	2.
170	17
•	
< 4	<
-5 +50	-5
>10 ⁷	>













YES element

The output signal "S" is only present when the pilot is present "a" is present:

30

S = a YES b

S = a



NOT element

The output signal "s" is present only if the input signal "a" is NOT present. The output signal is therefore the inverse of the pilot signal:

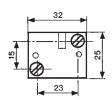
S= NOT a

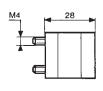
 $S = \overline{a}$

S = NOT a AND b

 $S = \overline{a} \cdot b$

81 501 031 - 81 503 028 81 504 035 - 81 506 027





$\langle \widehat{\epsilon}_{\mathsf{X}} \rangle$ Memory element

FILE No. C.PN.HOM.00004.FR INERIS No. 17564/04

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC



81 523 205 With pressure

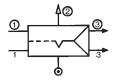
81 523 608

With pressure indicator and manual override

(€ II 2 G D c IIB 55°C(T6) X

Classification **Symbol**

Version



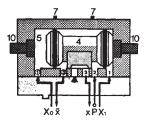
Characteristics

Colour		Black	Black
Operating pressure	bar	2 → 8	2 → 8
Orifice diameter	mm	2.7	2.7
Minimum memory pilot pressure	bar	2.5	2.5
Operating temperature	°C	-5 +50	-5 +50
Flow at 6 bars	NI/min	200	200
Connection - On sub-base page 36-37		•	•
Weight	g	90	90

Principle of operation

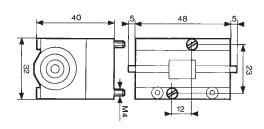
The function is that of a 4/2 valves. The appearence of signal "X1" causes the displacement of the slide valve. The output port "x" is then put under pressure. This state is remembered until the arrival of signal "X0". This signal reverses the slide valve, the output "x" is put under pressure. This state is likewise remembered. The output:

- "x" under pressure indicates that the information in the MEMORY is "X1",
- "x" under pressure indicates that the information in the MEMORY is "X0".

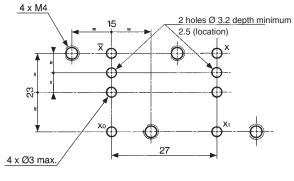


Dimensions

81 523 205 - 81 523 608



Dimensions of logic and memory elements



Viewed from above





FILE No. C.PN.HOM.00008.FR INERIS No. 18410/05

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC



81	503	543
Da	- i4i	

version	Positive output
Classification	(€ (II 2 G D c II B 60° C (T6) X

Symbol



Characteristics

Timing	S	0.4
Operating pressure	bar	2 → 8
Flow at 6 bars	NI/min	170
Orifice diameter	mm	2.7
Accuracy	%	± 5
Min. reset time	S	<0.1
Connection - On sub-base page 36-37		•
Operating temperature	°C	-5 +50
Mechanical life	operations	>10 ⁷
Weight	g	106

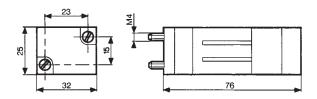
Principle of operation

with positive output



Dimensions

81 503 543





$\langle \widehat{\epsilon_{\mathsf{X}}} \rangle$ Timers (with adjustable timing)

FILE No. C.PN.HOM.00008.FR INERIS No. 18410/05

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC







		81 503 728	81 506 714	81 503 729	81 506 721	81 503 731	81 506 727
Function	positive	•	_	•	_	•	_
Function	negative	<u> </u>	•		•	_	•
Classification		(€ Sell 2 G D c II	IB 60°C(T6) X				

Symbol













Characteristics

Timing	S
Operating pressure	bar
Flow at 6 bars	NI/min
Orifice diameter	mm
Accuracy	%
Min. reset time	S
Connection - On sub-base	page 36-37
Operating temperature	°C
Mechanical life	operations
Weight	g
Accessories	

0.1 • 15
2 → 8
170
2.7
± 5
<0.1
•
-5 +50
>10 ⁷
90

79 451 698

0.1 • 15
2 → 8
170
2.7
± 5
<0.1
•
-5 +50
>10 ⁷
90

0.1 • 30	0
2 → 8	2
170	1
2.7	2
± 5	±
<0.1	<
•	
-5 +50	-!
>10 ⁷	>
100	1

79 451 903

.1 • 30 2 → 8 70 2.7 ± 5 <0.1 ·5 +50 >10⁷

0.1 • 60 0.1 • 60 2 → 8 170 2.7 2 → 8 170 ± 5 <0.1 -5 +50 >10⁷

120

2.7
± 5
<0.1
•
-5 +50
>10 ⁷

120

710000001100
Panel mounting adaptator
Weight

Weight	g	53
Principle		
The operation of these	pneumatic time	ers is similar to that of

electronic timers (circuit with capacitor/resistor)

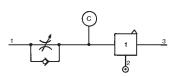
Principle of operation

with positive output

79 451 698

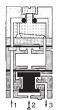
with negative output

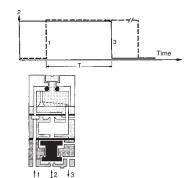
Timing by charging of reservoir



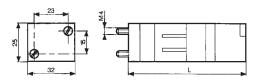
The reservoir fills via the flow restrictor until the switching point of the timer output is reached (positive or negative). The non-return valve allows the reservoir to be emptied rapidly for the next timing.







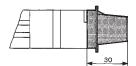
Dimensions

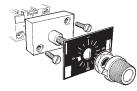


	L (mm)
81 503 728 - 81 506 714	78
81 503 729 - 81 506 721	92
81 503 731 - 81 506 727	125

Adaptator 79 451 . . .







For panel mounting, a pre-drilled hole Ø 10.5 mm si required





FILE No. C.PN.HOM.00008.FR INERIS No. 18410/05

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC







Single impulse generator	Fixed	81 507 543	_	_
	Adjustable		81 507 724	<u> </u>
Adjustable frequency generator		<u> </u>	<u> </u>	81 506 945
Classification		€ II 2 G D c IIB 60°	C(T6) X	

Symbol



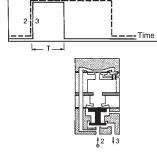


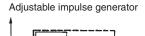


Characteristics				
Timing	S	0.4	0.1 → 30	_
Frequency	Hz	_	_	0.02 → 8
Operating pressure	bar	2 → 8	2 → 8	2 → 8
Flow at 6 bars	NI/min	170	170	170
Orifice diameter	mm	2.7	2.7	2.7
Accuracy	%	± 5	± 5	± 5
Min. reset time	S	<0.1	<0.1	<0.1
Connection - On sub-base page 36-37		•	•	•
Operating temperature	°C	-5 +50	-5 +50	-5 +50
Mechanical life	operations	>10 ⁷	>10 ⁷	>10 ⁷
Weight	g	106	180	85
Accessories				
Panel mounting adaptators		_	79 451 904	79 451 905
Weight (g)		_	53	53

Principle of operation

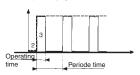
Single impulse generator

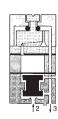




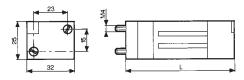


Frequency generator



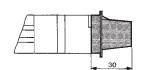


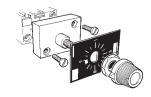
Dimensions



Part numbers	L (mm)
81 507 543	73
81 507 724	99
81 506 945	72







For panel mounting, a pre-drilled hole \varnothing 10.5 mm si required

$\langle {f \xi}_{\sf X} angle$ Timers components

FILE No. C.PN.HOM.00008.FR INERIS No. 18410/05

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC









One-way in-line fixed flow restritors

Flow at 4 bars Nm ³ /h	Ø orific	e (mm)
$0.18 \rightarrow 0.30$	0.3	white
$0.35 \rightarrow 0.50$	0.4	yellow
$0.58 \rightarrow 0.77$	0.5	red
$0.80 \rightarrow 1.06$	0.6	green
$1.10 \rightarrow 1.39$	0.7	blue
$1.45 \rightarrow 1.65$	0.8	grey
$2.30 \rightarrow 2.80$	1	black
$0.08 \rightarrow 0.12$	0.25	white
0.08 → 0.12	0.25	white

10 • 60 s

529 014 29 015 29 016 529 017 529 018 81 525 106 81 526 006

Classification

One-way adjustable flow restritor Capacity for timing

70 458 018 c IIB 90°C(T5) X

Symbol









Characteristics

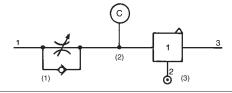
Characteris	แตร					
Free flow		NI/min	Depending on orifice	30	200	_
Orifice diamete	er	mm	Depending on orifice	$0 \to 0.5$	0 → 1.7	_
Operating pres	sure	bars	1 → 8	1 → 8	2 → 8	_
Timing		S		_		10 → 60
Capacity		cm ³		_		30
Connection	Sub-base page 36-37		<u> </u>	•	•	_
Connection	Push-in connection for semi- rigid tubing (NFE 49100)	mm	Ø 4	_	_	Ø 4
Operating temp	perature	°C	-5 +50	-5 +50	-5 +50	-5 +50
Weight		g	8	60	70	40

Connections

For timing circuit

- One-way flow restrictor 81 525 1 81 529 0 (1)
- Reservoir 79 458 018 (2) Relay element 81 503 0 81 506 0 (3) page 28-29

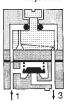
Sub-base page 36-37



Principle of operation

One-way with fixed flow

One-way with adjustable flow

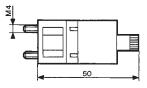


70 458 018

Dimensions

81 529 81 525 106

39



81 526 006

Ø 25 115





FILE No. C.PN.HOM.00008.FR INERIS No. 18410/05

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC





Plug element In-line non-return	81 520 602 —	<u> </u>
Classification	(€ © II 2 G D c IIB T6 X	C€

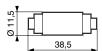
Symbol



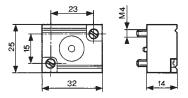


Characteris	stics			
Operating pres	ssure	bars	-	2 → 8
Flow at 6 bars		NI/min		200
Adjustable out	put pressure	bar	<u> </u>	
Connection	Sub-base page 36-37		•	<u></u>
Connection	Push-in connection for semi- rigid tubing (NFE 49100)	mm		Ø 4
Operating tem	perature	°C	-5 +50	-5 +50
Weight		g		

Dimensions 81 529 907





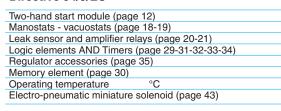


$\langle {\it ar \xi} {\it x} angle$ Sub-bases for logic elements and relays

FILE No. C.PN.HOM.00007.FR INERIS No. 18408/05 for 81 532 111, 81 532 109 and 81 532 009

FILE No. C.PN.HOM.00004.FR INERIS No. 17564/04 for 81 542 004

Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC









C€ II 2 G D c IIB T6 X

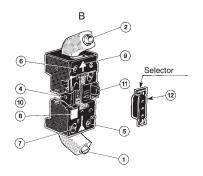
81 532 111	81 532 109	81 542 004
● 1	● 1	_
• 1	• 1	_
• 1	• 1	_
● 1	• 1	_
• 1	• 1	_
_	_	● 1
-5 +50	-5 +50	-5 +50
● 1	• 1	_
ted on the sub-base		

NB: The number indicates the number of components mounted on the sub-base				
Classification	C€			

Characteristics				
Push-in connection for semi-rigid tubing Ø 4 mm (NFE 49100)		rotatable	rotatable	rotatable
Fixation		DIN rail 35 mm EN 50022	DIN rail 35 mm EN 50022	DIN rail 35 mm EN 50022
Weight	g	56	52	95

Connections elements and relays

Front connecting 2 ×(7) (5)

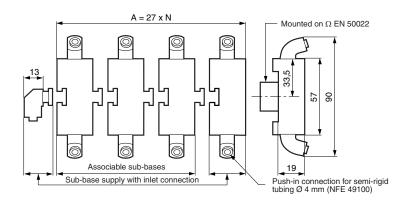


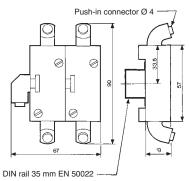
- A Single sub-base or end base
- B Associable sub-base
- 1 Input port (green port 1)
- 2 Output port (red port 3)
- 3 Input/supply port (yellow port 2) Ø 4
- 4 Input port integral to sub-base
- 5 Input indicator (green) 6 - Output indicator (red)
- 7 1/4 turn screws
- 8 Marking tag
- 9 Arrow indicating flow direction
- 10 Mounting tongue
- 11 Mounting groove
- 12 Selector

Dimensions

81 532 109 - 81 532 111

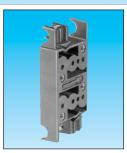
81 542 004









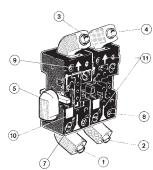


81 532 009
• 1
● 1
● 1
● 1
● 1
_
-5 +50
● 1

81 531 008	
• 2	
• 2	
• 2	
• 2	
• 2	
● 1	
-5 +50	
● 2	

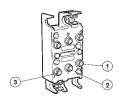
C€ II 2 G D c IIB T6 X	C€ S II 2 G D c IIB T6 X	
rear	rear	
2 M4 screws	Clips for rails Ø 8 mm	
10	35	

Memory element sub-base, front and rear connecting



- 1 Input port X1 (green port 1)
- 2 Input port X0 (green port 1)
- 3 Output port X (red port 3) 4 Output port X (red port 3)
- 5 Supply port (brass port 2) 7 1/4 turn screws
- 8 Input indicator
- 9 Output indicator
- 10 Marking tag
- 11 Arrow indicating the flow direction

Rear connection



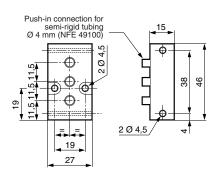
The modular system elements are fixed with two screws on the sub-base.

A locating device on each logic element prevents incorrect assembly.

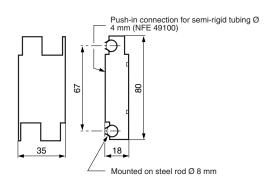
The logic element is connected via the sub-base. This sub-base has 3 instant connections for connecting semi-rigid tubes with outer Ø 4.

- 1 Input signal
- 2 Signal port for passive logic elements, air supply for active logic elements.
- 3 Output signal

81 532 009



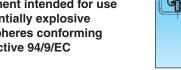
81 531 008



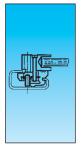
$\langle {f \xi} {f x} angle$ Mounting accessories

FILE No. C.PN.HOM.00007.FR INERIS No. 18408/05

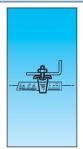
Equipment intended for use in potentially explosive atmospheres conforming to Directive 94/9/EC



°С











C€ Sil 2 G D c IIB T6 X

Mounting equipment

81 533 501

81 533 001 Clip domino 79 450 609 Bar clips Ø 8

79 450 618 Looking clip

81 536 804

Classification

Operating temperature

Supply manifold 13 outputs

Characteristics

Weight (g)

For mounting on the end of a zinc-coated mild steel rod Ø 8 mm on an asymmetrical DIN rail -5 +50

For adjustable mounting on a zinc-coated mild steel rod Ø 8 mm on an asymmetrical DIN rail -5 +50

80 Packet of 100 pieces

-5 +50

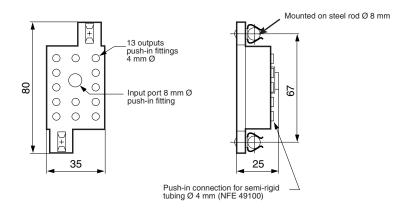
40 Packet of 100 pieces

-5 +50

-5 +50

80

Dimensions 81 536 804



Other information

Use Weidmuller plastic labels for marking components part number FW 4734-6.



Mouser Electronics

Authorized Distributor

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Crouzet:

81523205 81523608 81529014 81529016 81529026